PATENT COOPERATION TREAT

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing:	
10 February 2000 (10.02.00)	
International application No.: PCT/JP99/04092	Applicant's or agent's file reference: PH-676-PCT
International filing date: 29 July 1999 (29.07.99)	Priority date: 29 July 1998 (29.07.98)
Applicant: NARIMATSU, Hisashi et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International preliminary Examining Authority on:

11 November 1999 (11.11.99)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer:

J. Zahra

Telephone No.: (41-22) 338.83.38

12T

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PH-676-PCT	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/JP99/04092	International filing date (*day/month/year*) 29 July 1999 (29.07.99)	Priority date (*day/month/year*) 29 July 1998 (29.07.98)
International Patent Classification (IPC) or national classification and IPC C12N 9/10, 1/21, 5/10, 15/54, C12Q 1/68, C07K 16/40, A01K 67/027		
Applicant KYOWA HAKKO KOGYO CO., LTD.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
11 November 1999 (11.11.99)	01 March 2000 (01.03.2000)
Name and mailing address of the IPEA/JP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/JP99/04092

I. Basis of the report

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed

☐ the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the claims:

pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the drawings:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☒ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-49	YES
	Claims		NO
Inventive step (IS)	Claims	1-49	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-49	YES
	Claims		NO

2. Citations and explanations

The subject matters of claims 1-49 are neither described in any of the documents cited in the ISR nor obvious to a person skilled in the art in view of the prior art including those documents.

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2280 HV Rijswijk (ZH)
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Europäisches Patentamt
Zweigstelle in Den Haag Recherchen-abteilung

European Patent Office
Branch at The Hague Search division

Office européen des brevets
Département à La Haye Division de la recherche

VOSSIUS & PARTNER
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ALLEMAGNE

EINGEGANGEN
Vossius & Partner
04. Nov. 2002
Frist
bearb.:

Datum/Date
31.10.02

Zeichen/Ref./Réf.	Anmeldung Nr./Application No./Demande n°./Patent Nr./Patent No./Brevet n°.
F 1152 EP	99933171.3-2405-JP9904092

Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire
KYOWA HAKKO KOGYO CO., LTD.

COMMUNICATION

The European Patent Office herewith transmits as an enclosure the European search report for the above-mentioned European patent application.

If applicable, copies of the documents cited in the European search report are attached.

☒ Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well.

EUROPÄISCHES PATENTAMT · EUROPEAN PATENT OFFICE · OFFICE EUROPÉEN DES BREVETS
DEN HAAG · THE HAGUE · LA HAYE

REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.

European Patent Office

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application Number
EP 99 93 3171

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X (1)	WO 93 16178 A (US ARMY) 19 August 1993 (1993-08-19) * page 225; example 4 * ---	27,28	C12N9/10 C12N1/21 C12N5/10 C12N15/54 C12Q1/68 C07K16/40 A01K67/027
A (2)	WO 96 40881 A (GEN HOSPITAL CORP) 19 December 1996 (1996-12-19) * the whole document * ---		
P,X (3)	DATABASE EMBL 'Online! EMBL; H. sapiens mRNA for alpha-3-fucosyltransferase, 3 May 1999 (1999-05-03) MOLLICONE R. ET AL.: "Homo sapiens mRNA for alpha-3-fucosyltransferase" Database accession no. AJ238701 XP002216922 * abstract * -----	1-38, 40-42, 46-49	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

C12N

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search	Date of completion of the search	Examiner
MUNICH	16 October 2002	Pilat, D

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C04)

1

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 99 93 3171

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-10-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9316178 A	19-08-1993	AU 2240492 A	25-01-1993
		AU 3665893 A	03-09-1993
		EP 0593580 A1	27-04-1994
		WO 9300353 A1	07-01-1993
		WO 9316178 A2	19-08-1993
WO 9640881 A	19-12-1996	US 5858752 A	12-01-1999
		AU 5730896 A	30-12-1996
		CA 2223440 A1	19-12-1996
		EP 0832199 A1	01-04-1998
		JP 11512921 T	09-11-1999
		WO 9640881 A1	19-12-1996

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International Patent Classification (IPC) or national classification and IPC C12N 9/10, 1/21, 5/10, 15/54, C12Q 1/68, C07K 16/40, A01K 67/027		
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Form PCT/IPEA/409 (cover sheet) (July 1998)

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International application No.
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☐ the claims:

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pages _____, filed with the demand
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	Claims		NO
Industrial applicability (IA)	Claims	1-49	YES
	Claims		NO

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特　許　協　力　条　約

PCT

国際予備審査報告

（法第１２条、法施行規則第56条）
〔ＰＣＴ３６条及びＰＣＴ規則70〕

出願人又は代理人の書類記号　ＰＨ－６７６－ＰＣＴ	今後の手続きについては、国際予備審査報告の送付通知（様式ＰＣＴ／ＩＰＥＡ／４１６）を参照すること。	
国際出願番号 ＰＣＴ／ＪＰ９９／０４０９２	国際出願日 （日.月.年）　２９．０７．９９	優先日 （日.月.年）　２９．０７．９８
国際特許分類（ＩＰＣ）　Ｉｎｔ．Ｃｌ⁷　Ｃ１２Ｎ９／１０，１／２１，５／１０，１５／５４，Ｃ１２Ｑ１／６８，Ｃ０７Ｋ１６／４０，Ａ０１Ｋ６７／０２７		
出願人（氏名又は名称）　協和醗酵工業株式会社		

１．　国際予備審査機関が作成したこの国際予備審査報告を法施行規則第57条（ＰＣＴ３６条）の規定に従い送付する。

２．　この国際予備審査報告は、この表紙を含めて全部で　3　ページからなる。

☐　この国際予備審査報告には、附属書類、つまり補正されて、この報告の基礎とされた及び／又はこの国際予備審査機関に対してした訂正を含む明細書、請求の範囲及び／又は図面も添付されている。
（ＰＣＴ規則70.16及びＰＣＴ実施細則第６０７号参照）
この附属書類は、全部で＿＿＿＿＿＿ページである。

３．　この国際予備審査報告は、次の内容を含む。

I　☒　国際予備審査報告の基礎

II　☐　優先権

III　☐　新規性、進歩性又は産業上の利用可能性についての国際予備審査報告の不作成

IV　☐　発明の単一性の欠如

V　☒　ＰＣＴ３５条(2)に規定する新規性、進歩性又は産業上の利用可能性についての見解、それを裏付けるための文献及び説明

VI　☐　ある種の引用文献

VII　☐　国際出願の不備

VIII　☐　国際出願に対する意見

国際予備審査の請求書を受理した日　１１．１１．９９	国際予備審査報告を作成した日　０１．０３．００
名称及びあて先 日本国特許庁（ＩＰＥＡ／ＪＰ） 郵便番号１００－８９１５ 東京都千代田区霞が関三丁目４番３号	特許庁審査官（権限のある職員）　４Ｎ　８２１４ 内　田　俊　生　印 電話番号　０３－３５８１－１１０１　内線　３４８８

様式ＰＣＴ／ＩＰＥＡ／４０９（表紙）（１９９８年７月）

国際予備審査報告

国際出願番号　ＰＣＴ／ＪＰ９９／０４０９２

Ⅰ．　国際予備審査報告の基礎

1．　この国際予備審査報告は下記の出願書類に基づいて作成された。（法第６条（ＰＣＴ１４条）の規定に基づく命令に応答するために提出された差し替え用紙は、この報告書において「出願時」とし、本報告書には添付しない。ＰＣＴ規則70.16, 70.17）

☒ 出願時の国際出願書類

☐ 明細書　第 ＿＿＿＿＿＿＿＿ ページ、　出願時に提出されたもの
明細書　第 ＿＿＿＿＿＿＿＿ ページ、　国際予備審査の請求書と共に提出されたもの
明細書　第 ＿＿＿＿＿＿＿＿ ページ、　＿＿＿＿＿＿＿＿ 付の書簡と共に提出されたもの

☐ 請求の範囲　第 ＿＿＿＿＿＿＿＿ 項、　出願時に提出されたもの
請求の範囲　第 ＿＿＿＿＿＿＿＿ 項、　ＰＣＴ１９条の規定に基づき補正されたもの
請求の範囲　第 ＿＿＿＿＿＿＿＿ 項、　国際予備審査の請求書と共に提出されたもの
請求の範囲　第 ＿＿＿＿＿＿＿＿ 項、　＿＿＿＿＿＿＿＿ 付の書簡と共に提出されたもの

☐ 図面　第 ＿＿＿＿＿＿＿＿ ページ／図、　出願時に提出されたもの
図面　第 ＿＿＿＿＿＿＿＿ ページ／図、　国際予備審査の請求書と共に提出されたもの
図面　第 ＿＿＿＿＿＿＿＿ ページ／図、　＿＿＿＿＿＿＿＿ 付の書簡と共に提出されたもの

☐ 明細書の配列表の部分　第＿＿＿＿＿＿ ページ、　出願時に提出されたもの
明細書の配列表の部分　第＿＿＿＿＿＿ ページ、　国際予備審査の請求書と共に提出されたもの
明細書の配列表の部分　第＿＿＿＿＿＿ ページ、　＿＿＿＿＿＿＿＿ 付の書簡と共に提出されたもの

2．　上記の出願書類の言語は、下記に示す場合を除くほか、この国際出願の言語である。

上記の書類は、下記の言語である ＿＿＿＿＿＿ 語である。

☐ 国際調査のために提出されたＰＣＴ規則23.1(b)にいう翻訳文の言語
☐ ＰＣＴ規則48.3(b)にいう国際公開の言語
☐ 国際予備審査のために提出されたＰＣＴ規則55.2または55.3にいう翻訳文の言語

3．　この国際出願は、ヌクレオチド又はアミノ酸配列を含んでおり、次の配列表に基づき国際予備審査報告を行った。

☐ この国際出願に含まれる書面による配列表
☒ この国際出願と共に提出されたフレキシブルディスクによる配列表
☐ 出願後に、この国際予備審査（または調査）機関に提出された書面による配列表
☐ 出願後に、この国際予備審査（または調査）機関に提出されたフレキシブルディスクによる配列表
☐ 出願後に提出した書面による配列表が出願時における国際出願の開示の範囲を超える事項を含まない旨の陳述書の提出があった
☒ 書面による配列表に記載した配列とフレキシブルディスクによる配列表に記録した配列が同一である旨の陳述書の提出があった。

4．　補正により、下記の書類が削除された。
☐ 明細書　第 ＿＿＿＿＿＿＿＿ ページ
☐ 請求の範囲　第 ＿＿＿＿＿＿＿＿ 項
☐ 図面　図面の第 ＿＿＿＿＿＿＿＿ ページ／図

5．☐ この国際予備審査報告は、補充欄に示したように、補正が出願時における開示の範囲を越えてされたものと認められるので、その補正がされなかったものとして作成した。（ＰＣＴ規則70.2(c)　この補正を含む差し替え用紙は上記１．における判断の際に考慮しなければならず、本報告に添付する。）

国際予備審査報告

国際出願番号　ＰＣＴ／ＪＰ９９／０４０９２

Ⅴ．　新規性、進歩性又は産業上の利用可能性についての法第１２条（ＰＣＴ３５条(2)）に定める見解、それを裏付ける文献及び説明

１．　見解

新規性（Ｎ）	請求の範囲	１－４９	有
	請求の範囲		無
進歩性（ＩＳ）	請求の範囲	１－４９	有
	請求の範囲		無
産業上の利用可能性（ＩＡ）	請求の範囲	１－４９	有
	請求の範囲		無

２．　文献及び説明（ＰＣＴ規則70.7）

請求の範囲１－４９に記載されている発明は、国際調査報告で引用されたいずれの文献にも記載されておらず、かつ、当該技術分野の専門家にとってそれらの文献を含む先行技術からみて自明のものでもない。

(Translation)

INTERNATIONAL FORM

BUDAPEST TREATY ON THE INTERNATIONAL RECOGNITION OF THE DEPOSIT OF MICROORGANISMS FOR THE PURPOSES OF PATENT PROCEDURE

RECEIPT IN THE CASE OF AN ORIGINAL DEPOSIT

issued pursuant to Rule 7.1 by the INTERNATIONAL DEPOSITARY AUTHORITY identified at the bottom of this page.

TO DEPOSITOR:

Name: Kyowa Hakko Kogyo Co., Ltd.
Representative: Tadashi HIRATA

Address: 6-1, Ohtemachi 1-chome, Chiyoda-ku, Tokyo

I. IDENTIFICATION OF MICROORGANISM	
Identification Reference Given by the Depositor: *Escherichia coli* SOLR™ Strain/pBS-hFT9 (S2)	Accession Number: FERM BP-6416

II. A SCIENTIFIC DESCRIPTION AND/OR PROPOSED TAXONOMIC POSITION

The microorganism identified under I above was accompanied by a document stating the following item(s).

☐ A Scientific Property
■ Taxonomic Position

III. RECEIPT AND ACCEPTANCE

This International Depositary Authority accepts the microorganism identified under I above, which was received on July 10, 1998. (date of the original deposit)

IV. RECEIPT OF REQUEST FOR TRANSFER

This International Depositary Authority received the microorganism under I above on (date of the original deposit), and received on , a request for transfer from the original deposit to the deposit under the Budapest treaty.

V. INTERNATIONAL DEPOSITARY AUTHORITY

Name: National Institute of Bioscience and Human-Technology Agency of Industrial Science and Technology

Representative: Shinichi Ohashi (sealed)
Dr., Director-General

Address: 1-3, Higashi 1-chome, Tsukuba-shi, Ibaraki-ken 305-8566, JAPAN

Date: July 10, 1998

国際様式　INTERNATIONAL FORM

BUDAPEST TREATY ON THE INTERNATIONAL RECOGNITION OF THE DEPOSIT OF MICROORGANISMS FOR THE PURPOSES OF PATENT PROCEDURE

[特許手続上の微生物の寄託の国際的承認に関するブダペスト条約]

RECEIPT IN THE CASE OF AN ORIGINAL DEPOSIT

下記国際寄託当局によって規則7．1に従い発行される。

issued pursuant to Rule 7.1 by the INTERNATIONAL DEPOSITARY AUTHORITY identified at the bottom of this page.

原寄託についての受託証

寄託者
氏名（名称）　協和醗酵工業株式会社 取締役社長　平田　正　殿
あて名　〒　東京都千代田区大手町一丁目6番1号

1．微生物の表示	
(寄託者が付した識別のための表示) Escherichia coli SOLR™ Strain／pBS−hFT9 (S2)	(受託番号) FERM BP− 6416

2．科学的性質及び分類学上の位置

1欄の微生物には、次の事項を記載した文書が添付されていた。

□ 科学的性質
■ 分類学上の位置

3．受領及び受託

本国際寄託当局は、平成 10 年 7 月 10 日（原寄託日）に受領した1欄の微生物を受託する。

4．移管請求の受領

本国際寄託当局は、　年　月　日（原寄託日）に1欄の微生物を受領した。
そして、　年　月　日に原寄託よりブダペスト条約に基づく寄託への移管請求を受領した。

5．国際寄託当局

通商産業省工業技術院生命工学工業技術研究所

名　称：　National Institute of Bioscience and Human-Technology Agency of Industrial Science and Technology

所　長　大箸　信一郎　Dr. Shinichiro Ohashi　Director-General

あて名：　日本国茨城県つくば市東1丁目1番3号（郵便番号305−8566）
1-3, Higashi 1 chome Tsukuba-shi Ibaraki-ken 305-8566, JAPAN

平成10年（1998）　7月10日

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing: 10 February 2000 (10.02.00)	
International application No.: PCT/JP99/04092	Applicant's or agent's file reference: PH-676-PCT
International filing date: 29 July 1999 (29.07.99)	Priority date: 29 July 1998 (29.07.98)
Applicant: NARIMATSU, Hisashi et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International preliminary Examining Authority on:

11 November 1999 (11.11.99)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer: J. Zahra Telephone No.: (41-22) 338.83.38

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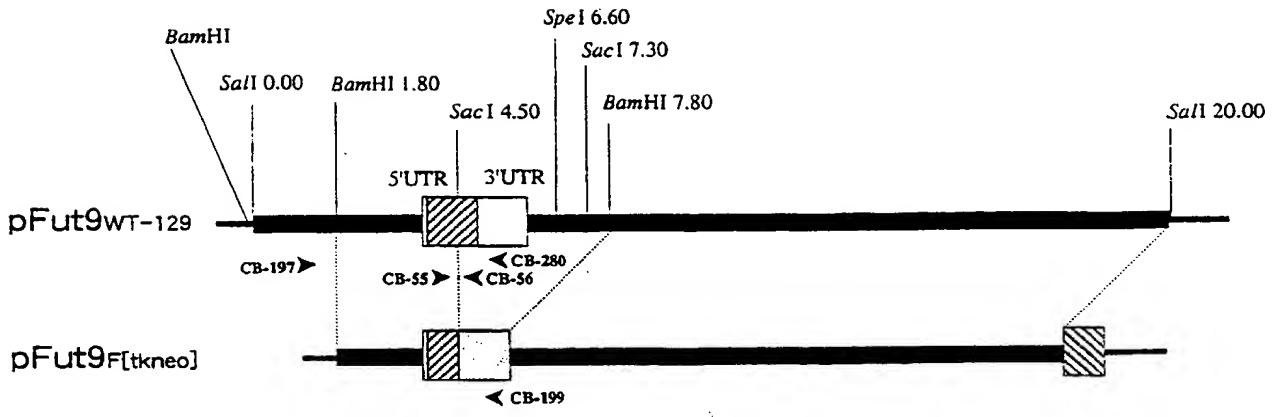

翻訳領域

非翻訳領域

ネオマイシン耐性遺伝子

チミジンキナーゼ遺伝子

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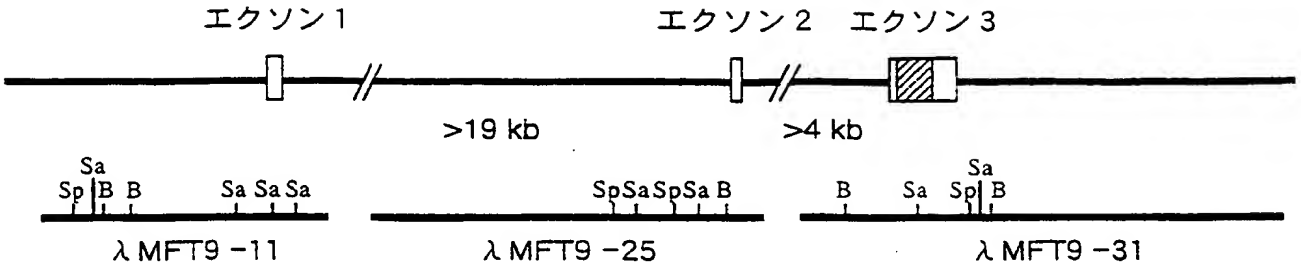
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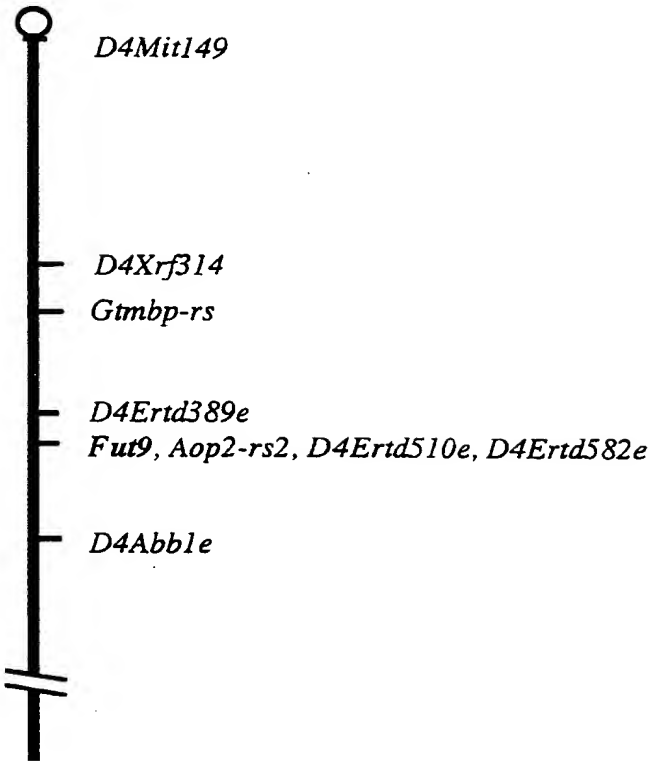
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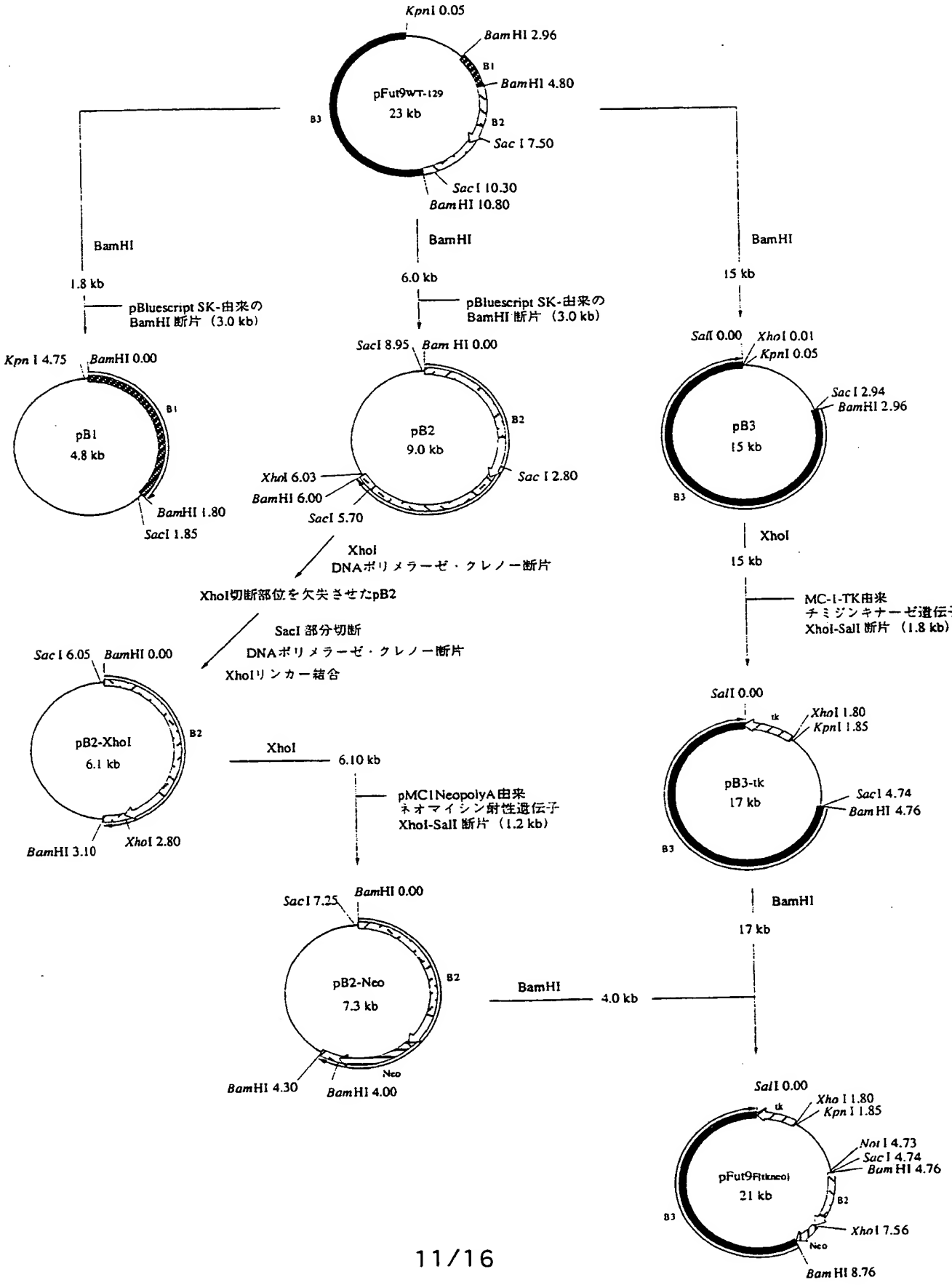
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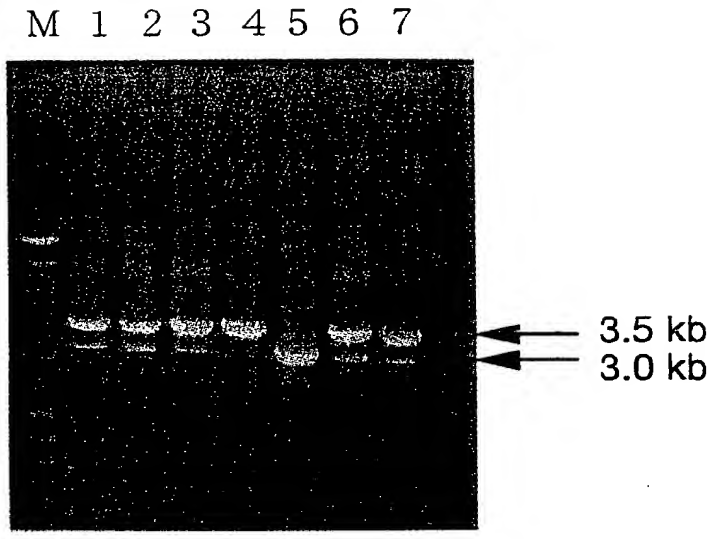

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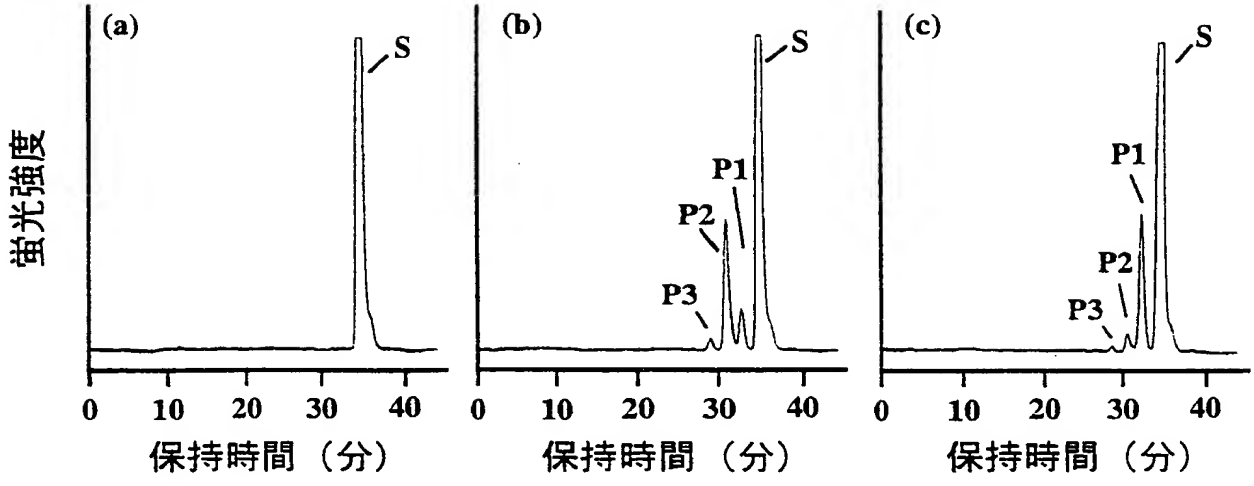

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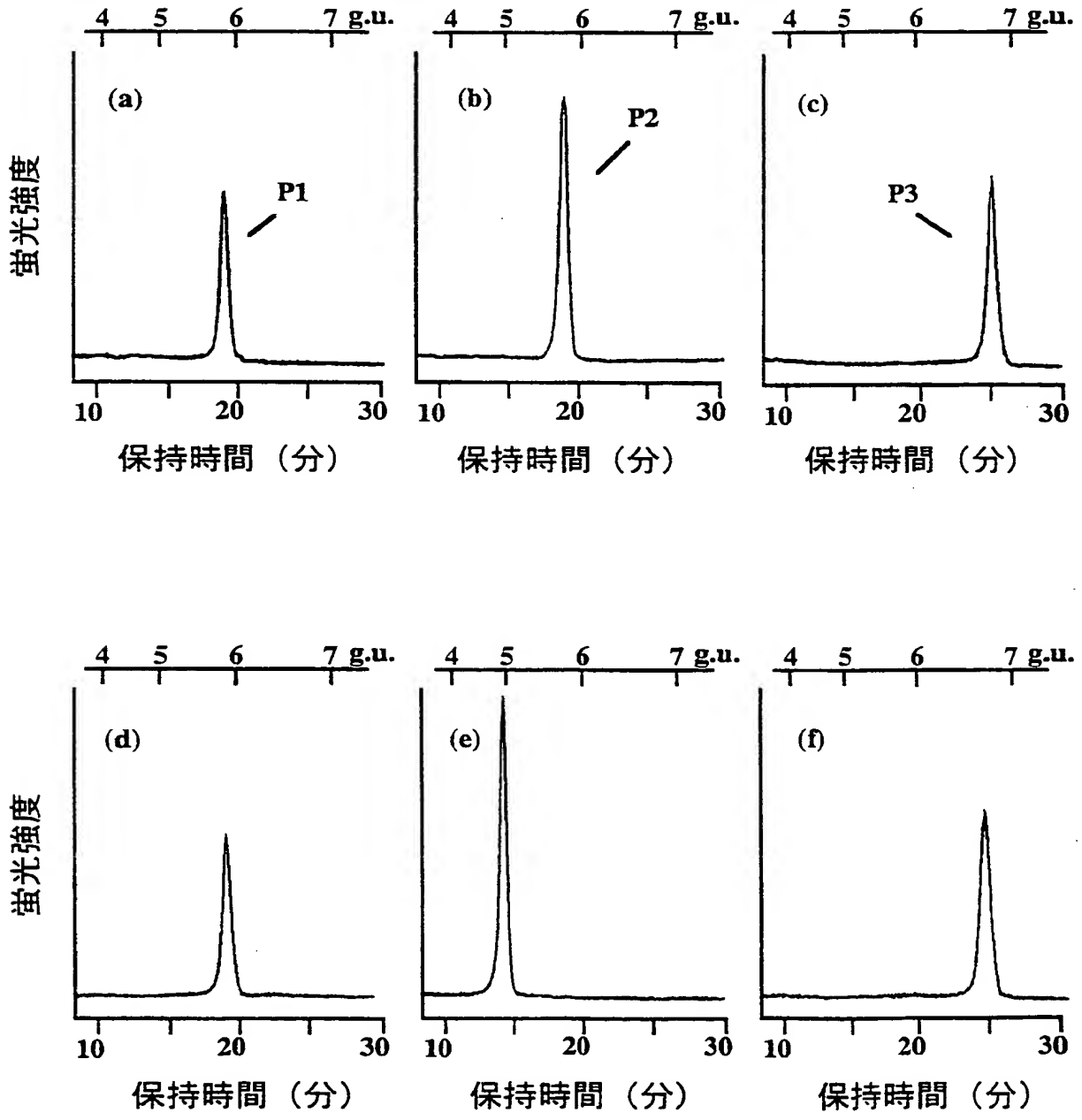

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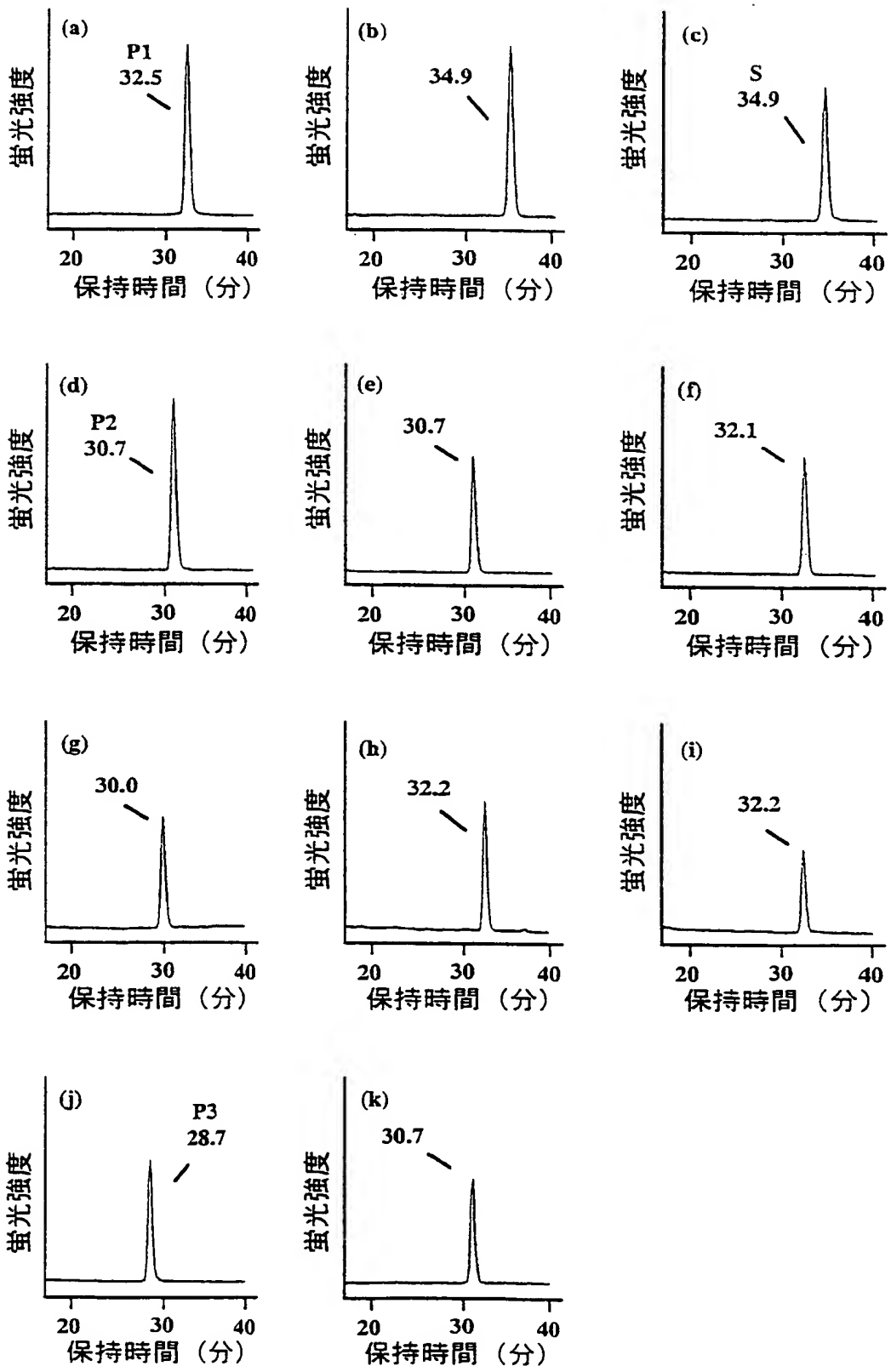
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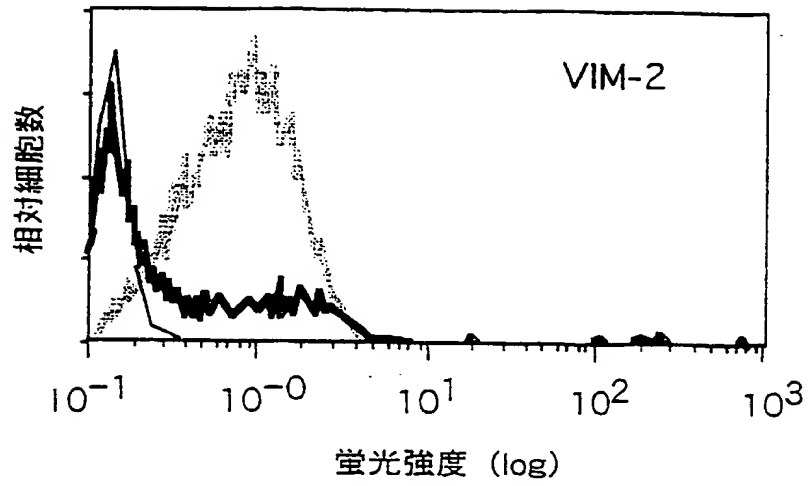
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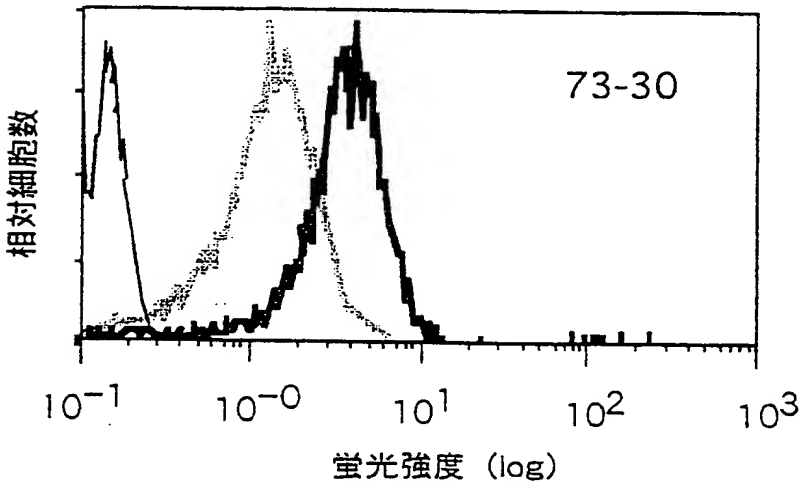
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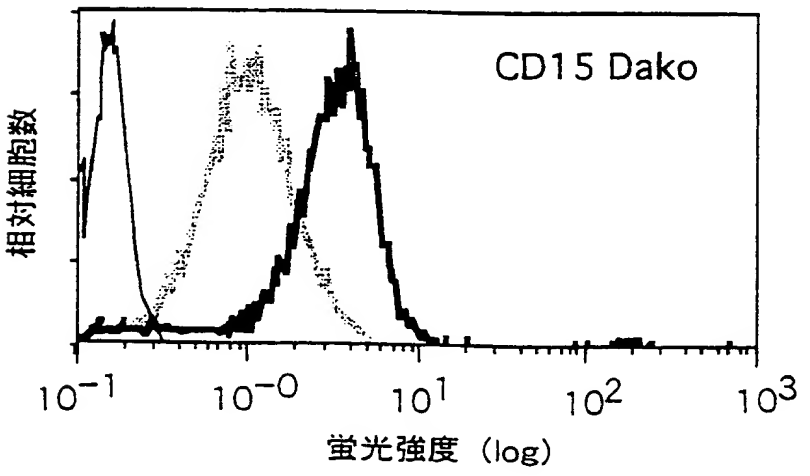
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Met Thr Ser Thr Ser Lys Gly Ile
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Leu Arg Pro Phe Leu Ile Val Cys Ile Ile Leu Gly Cys Phe Met Ala
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tgt ctt ctc att tac atc aaa cct acc aac agc tgg atc ttc agt cca 1408

Cys Leu Leu Ile Tyr Ile Lys Pro Thr Asn Ser Trp Ile Phe Ser Pro
25 30 35 40

atg gaa tca gcc agc tct gtg ctg aaa atg aaa aac ttc ttt tcc acc 1456

Met Glu Ser Ala Ser Ser Val Leu Lys Met Lys Asn Phe Phe Ser Thr
45 50 55

aaa act gat tat ttt aat gaa act act att ctg gtg tgg gtg tgg cca 1504

Lys Thr Asp Tyr Phe Asn Glu Thr Thr Ile Leu Val Trp Val Trp Pro
60 65 70

ttt ggg cag acc ttt gac ctt aca tcc tgc caa gca atg ttc aac atc 1552

Phe Gly Gln Thr Phe Asp Leu Thr Ser Cys Gln Ala Met Phe Asn Ile
75 80 85

caa gga tgc cat ctc aca acg gac cgt tca ctg tac aac aaa tcc cat 1600

Gln Gly Cys His Leu Thr Thr Asp Arg Ser Leu Tyr Asn Lys Ser His
90 95 100

gca gtt ctg atc cat cac cga gac atc agt tgg gat ctg aca aat tta 1648

Ala Val Leu Ile His His Arg Asp Ile Ser Trp Asp Leu Thr Asn Leu
105 110 115 120

cct cag caa gct agg cca ccc ttc cag aaa tgg att tgg atg aat ttg 1696

Pro Gln Gln Ala Arg Pro Pro Phe Gln Lys Trp Ile Trp Met Asn Leu
125 130 135

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Glu Ser Pro Thr His Thr Pro Gln Lys Ser Gly Ile Glu His Leu Phe
140 145 150

aac ctg act ctg act tac cgc cgt gat tca gat atc caa gtg cct tat 1792

Asn Leu Thr Leu Thr Tyr Arg Arg Asp Ser Asp Ile Gln Val Pro Tyr
155 160 165

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Gly Phe Leu Thr Val Ser Thr Asn Pro Phe Val Phe Glu Val Pro Ser
170 175 180

aaa gag aaa ttg gtg tgc tgg gtt gtg agt aac tgg aac cct gag cat 1888

Lys Glu Lys Leu Val Cys Trp Val Val Ser Asn Trp Asn Pro Glu His
185 190 195 200

gcc aga gtc aag tat tac aat gag cta agc aaa agc att gaa atc cat 1936

Ala Arg Val Lys Tyr Tyr Asn Glu Leu Ser Lys Ser Ile Glu Ile His
205 210 215

acc tac ggg caa gca ttt gga gaa tat gtc aat gat aaa aat ttg att 1984

Thr Tyr Gly Gln Ala Phe Gly Glu Tyr Val Asn Asp Lys Asn Leu Ile
220 225 230

cct acc ata tct gct tgt aaa ttt tat ctt tcc ttt gaa aat tca atc 2032

Pro Thr Ile Ser Ala Cys Lys Phe Tyr Leu Ser Phe Glu Asn Ser Ile
235 240 245

cac aag gat tac atc acg gaa aag cta tac aat gct ttt ctg gct ggc 2080

His Lys Asp Tyr Ile Thr Glu Lys Leu Tyr Asn Ala Phe Leu Ala Gly
250 255 260

tct gta cct gtt gtt ctg gga cca tct agg gaa aac tat gag aat tat 2128

Ser Val Pro Val Val Leu Gly Pro Ser Arg Glu Asn Tyr Glu Asn Tyr
265 270 275 280

att cca gca gat tca ttc att cat gtg gaa gat tat aac tct ccc agt 2176

Ile Pro Ala Asp Ser Phe Ile His Val Glu Asp Tyr Asn Ser Pro Ser
285 290 295

gag cta gca aag tat ctg aag gaa gtc gac aaa aac aat aag tta tac 2224

Glu Leu Ala Lys Tyr Leu Lys Glu Val Asp Lys Asn Asn Lys Leu Tyr
300 305 310

ctt agt tac ttt aac tgg agg aag gat ttc act gta aat ctt cca cga 2272

Leu Ser Tyr Phe Asn Trp Arg Lys Asp Phe Thr Val Asn Leu Pro Arg
315 320 325

ttt tgg gaa tca cat gca tgt ttg gct tgc gat cat gtg aaa agg cat 2320

Phe Trp Glu Ser His Ala Cys Leu Ala Cys Asp His Val Lys Arg His
330 335 340

caa gaa tat aag tct gtt ggt aat tta gag aaa tgg ttt tgg aat 2365

Gln Glu Tyr Lys Ser Val Gly Asn Leu Glu Lys Trp Phe Trp Asn
345 350 355

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aca tca aca tcc aaa gga att ctt cgc cca ttt tta att gtc tgc att 345

Thr Ser Thr Ser Lys Gly Ile Leu Arg Pro Phe Leu Ile Val Cys Ile
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Ile Leu Gly Cys Phe Met Ala Cys Leu Leu Ile Tyr Ile Lys Pro Thr
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aac agc tgg atc ttc agt cca atg gaa tca gcc agc tct gtg ctg aaa 441

Asn Ser Trp Ile Phe Ser Pro Met Glu Ser Ala Ser Ser Val Leu Lys
35 40 45

atg aaa aac ttc ttt tcc acc aaa act gat tat ttt aat gaa act act 489

Met Lys Asn Phe Phe Ser Thr Lys Thr Asp Tyr Phe Asn Glu Thr Thr
50 55 60 65

att ctg gtg tgg gtg tgg cca ttt ggg cag acc ttt gac ctt aca tcc 537

Ile Leu Val Trp Val Trp Pro Phe Gly Gln Thr Phe Asp Leu Thr Ser
70 75 80

tgc caa gca atg ttc aac atc caa gga tgc cat ctc aca acg gac cgt 585

Cys Gln Ala Met Phe Asn Ile Gln Gly Cys His Leu Thr Thr Asp Arg
85 90 95

tca ctg tac aac aaa tcc cat gca gtt ctg atc cat cac cga gac atc 633

Ser Leu Tyr Asn Lys Ser His Ala Val Leu Ile His His Arg Asp Ile
100 105 110

agt tgg gat ctg aca aat tta cct cag caa gct agg cca ccc ttc cag 681

Ser Trp Asp Leu Thr Asn Leu Pro Gln Gln Ala Arg Pro Pro Phe Gln
115 120 125

aaa tgg att tgg atg aat ttg gaa tca cca act cac act ccc caa aag 729

Lys Trp Ile Trp Met Asn Leu Glu Ser Pro Thr His Thr Pro Gln Lys
130 135 140 145

agt ggc att gag cac ttg ttt aac ctg act ctg act tac cgc cgt gat 777

Ser Gly Ile Glu His Leu Phe Asn Leu Thr Leu Thr Tyr Arg Arg Asp
150 155 160

tca gat atc caa gtg cct tat ggc ttc ttg acg gta agc aca aat ccc 825

Ser Asp Ile Gln Val Pro Tyr Gly Phe Leu Thr Val Ser Thr Asn Pro
165 170 175

ttc gtg ttt gaa gtg cca agc aaa gag aaa ttg gtg tgc tgg gtt gtg 873

Phe Val Phe Glu Val Pro Ser Lys Glu Lys Leu Val Cys Trp Val Val
180 185 190

agt aac tgg aac cct gag cat gcc aga gtc aag tat tac aat gag cta 921

Ser Asn Trp Asn Pro Glu His Ala Arg Val Lys Tyr Tyr Asn Glu Leu
195 200 205

agc aaa agc att gaa atc cat acc tac ggg caa gca ttt gga gaa tat 969

Ser Lys Ser Ile Glu Ile His Thr Tyr Gly Gln Ala Phe Gly Glu Tyr
210 215 220 225

gtc aat gat aaa aat ttg att cct acc ata tct gct tgt aaa ttt tat 1017

Val Asn Asp Lys Asn Leu Ile Pro Thr Ile Ser Ala Cys Lys Phe Tyr
230 235 240

ctt tcc ttt gaa aat tca atc cac aag gat tac atc acg gaa aag cta 1065

Leu Ser Phe Glu Asn Ser Ile His Lys Asp Tyr Ile Thr Glu Lys Leu
245 250 255

tac aat gct ttt ctg gct ggc tct gta cct gtt gtt ctg gga cca tct 1113

Tyr Asn Ala Phe Leu Ala Gly Ser Val Pro Val Val Leu Gly Pro Ser
260 265 270

agg gaa aac tat gag aat tat att cca gca gat tca ttc att cat gtg 1161

Arg Glu Asn Tyr Glu Asn Tyr Ile Pro Ala Asp Ser Phe Ile His Val

275 280 285

gaa gat tat aac tct ccc agt gag cta gca aag tat ctg aag gaa gtc 1209

Glu Asp Tyr Asn Ser Pro Ser Glu Leu Ala Lys Tyr Leu Lys Glu Val
290 295 300 305

gac aaa aac aat aag tta tac ctt agt tac ttt aac tgg agg aag gat 1257

Asp Lys Asn Asn Lys Leu Tyr Leu Ser Tyr Phe Asn Trp Arg Lys Asp
310 315 320

ttc act gta aat ctt cca cga ttt tgg gaa tca cat gca tgt ttg gct 1305

Phe Thr Val Asn Leu Pro Arg Phe Trp Glu Ser His Ala Cys Leu Ala
325 330 335

tgc gat cat gtg aaa agg cat caa gaa tat aag tct gtt ggt aat tta 1353

Cys Asp His Val Lys Arg His Gln Glu Tyr Lys Ser Val Gly Asn Leu
340 345 350

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Glu Lys Trp Phe Trp Asn
355

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<212> DNA

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atttatatgg ttttagggag atttgattgt ttgttttgtg ggtttagtcc ctaataatac 1800

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aaataatttc ctcttataac aataaaaaaa tgatatcttc aaatacaaat aaatgtataa 1920

attataccat ttatagaacg ctagttactt cattcatttg aaatattttt tccaaagcat 1980

ccatatttaa gttttatttt actgtatttg ttaataaata gaagtaaaac ttgaaa 2036

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